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EXAMINER	
THOMPSON, JAMES A	

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/938,492	MEHIGAN, MICHAEL	
	Examiner	Art Unit	
	James A. Thompson	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see page 7, lines 6-12, filed 08 August 2005, with respect to the drawings have been fully considered and are persuasive. The objections to the drawings listed in item 2 of the previous office action, dated 17 March 2005, have been withdrawn.

2. Applicant's arguments, see page 7, lines 13-20, filed 08 August 2005, with respect to the rejections under 35 USC §112, second paragraph have been fully considered and are persuasive. The rejections under 35 USC §112, second paragraph listed in items 3-4 of said previous office action have been withdrawn.

3. Applicant's arguments filed 08 August 2005 have been fully considered but they are not persuasive. Examiner has not argued, nor does the cited portion of Kanno (US Patent 4,998,122) suggest, that the first threshold value is the "first dithering technique" recited in present claim 1. The cited portions of Kanno demonstrate a first dithering technique (column 5, lines 3-6 and lines 21-27 of Kanno), which is a dithering technique selected if it is determined that the local region represents a bold-character portion, and a second dithering technique (column 9, lines 36-43 of Kanno), which is a dithering technique selected if the local region is determined to *not* be a bold character portion. While this is clear from the cited portion, Kanno additionally explains the dithering technique selection in column 5, lines 7-14 of Kanno. Specifically, Kanno states that the "[t]hreshold value selection

section 5 receives results of the determination which feature-analyzing section 2 makes to see whether the local region represents a photograph portion or a character portion. Section 5 is made up of a switch and selects either an output of first threshold value calculation section 6 or an output of second threshold value calculation section 7, in accordance with the results of the determination." Thus, the manner in which the thresholding, and by logical extension the dithering, is performed is based on the results of a local region determination and the subsequent resultant switching of a digital circuit. Thus, Kanno clearly shows two distinct methods of dithering.

Ostromoukhov (US Patent 5,438,431) also shows different methods of dithering, specifically a clustered dot dither technique (figure 3 and column 1, line 63 to column 2, line 4 of Ostromoukhov), and a dispersed dot dithering technique (figure 4 and column 1, lines 40-47 of Ostromoukhov). Since the two different types of dithering techniques taught by Ostromoukhov have distinct advantages for different types of local regions of image data, such as the types of local regions taught by Kanno, one of ordinary skill in the art at the time of the invention would clearly have been motivated to apply the types of dithering techniques taught by Ostromoukhov in order to obtain superior printing results. As clearly stated in said previous office action, "The clustered dot dithering technique has advantages for a particular type of image data, specifically image data that only requires a restricted number of grayscale levels (column 1, line 63 to column 2, line 4 of Ostromoukhov), such as text, line data, and the like. While the clustered dot dithering technique does not render small image details well

(column 2, lines 4-7 of Ostromoukhov), the dispersed dot dithering technique does render small image details well (column 1, lines 45-47 of Ostromoukhov)" [page 5, lines 4-12 of said previous office action]. Thus, clustered dot dithering is a superior technique for text and line drawing regions and dispersed dot dithering is a superior technique for regions that do not have text or line drawings. Furthermore, the motivation to combine the Kanno and Ostromoukhov has clearly been set forth on page 5, lines 16-21 of said previous office action. As can be seen, the motivation is derived solely from the teachings of the prior art references.

Finally, in response to Applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., receiving data as PDL (Page Description Language) data from a personal computer) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 12, 13 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 12, 13 and 14

recite the limitation "the software". There is insufficient antecedent basis for this limitation in the claims.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 8, 10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno (US Patent 4,998,122) in view of Ostromoukhov (US Patent 5,438,431).

Regarding claims 1 and 10: Kanno discloses detecting a predetermined property of a line-like part (figure 9(A,B,C) of Kanno) of the halftone image (column 4, lines 15-20 of Kanno); and processing the line-like part of the halftone image by a first dithering technique (column 5, lines 3-6 and lines 21-27 of Kanno) or a second dithering technique (column 9, lines 36-43 of Kanno) according to the predetermined property of the line-like part (column 4, lines 19-22 of Kanno).

Further regarding claim 10: Kanno teaches using a recording medium in which a program for carrying out the method is recorded (column 4, line 66 to column 5, line 2 and column 8, lines 28-33 of Kanno).

Kanno does not disclose expressly that said halftone image is a halftone color image; that said first dithering technique

is a clustered dot dithering technique; and that said second dithering technique is a dispersed dot dithering technique.

Ostromoukhov discloses, as part of the discussion of the prior art, a halftone color image (column 1, lines 16-23 of Ostromoukhov); a clustered dot dither technique (figure 3 and column 1, line 63 to column 2, line 4 of Ostromoukhov); and a dispersed dot dithering technique (figure 4 and column 1, lines 40-47 of Ostromoukhov). Clustered dot dithering does not render the smaller image details very well (figure 1 and column 2, lines 4-7 of Ostromoukhov) and dispersed dot dithering is better for rendering the smaller image details (column 1, lines 45-47 of Ostromoukhov), but can have certain banding artifacts (figure 2 and column 1, lines 50-54 of Ostromoukhov).

Kanno and Ostromoukhov are combinable because they are from the same field of endeavor, namely digital image data dithering and processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to be able to select between at least two dithering techniques, as taught by Kanno, wherein said first dithering technique taught by Kanno is the clustered dot dithering technique taught by Ostromoukhov, and wherein said second dithering technique taught by Kanno is the dispersed dot dithering technique taught by Ostromoukhov. The clustered dot dithering technique has advantages for a particular type of image data, specifically image data that only requires a restricted number of grayscale levels (column 1, line 63 to column 2, line 4 of Ostromoukhov), such as text, line data, and the like. While the clustered dot dithering technique does not render small image details well (column 2, lines 4-7 of Ostromoukhov), the dispersed dot dithering technique does render small image details well (column 1, lines 45-47 of

Ostromoukhov). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the system taught by Kanno to switch between the clustered dot and dispersed dot dithering techniques taught by Ostromoukhov, depending upon the type of image data encountered. The motivation for doing so would have been that the different dithering techniques provide good results, along with some associated artifacts, for different types of image data (column 1, lines 45-47 and lines 50-54; and column 2, lines 4-7 of Ostromoukhov). Further, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to perform the image processing method on a color image, as taught by Ostromoukhov. The suggestion for doing so would have been that each color plane can be processed as an individual halftone image (column 1, lines 16-23 of Ostromoukhov). Therefore, it would have been obvious to combine Ostromoukhov with Kanno to obtain the invention as specified in claims 1 and 10.

Regarding claim 8: Kanno discloses an apparatus (figure 1 of Kanno) comprising a selecting means (figure 1(9) of Kanno) which selects a first dithering technique (column 5, lines 3-6 and lines 21-27 of Kanno) or a second dithering technique (column 9, lines 36-43 of Kanno) according to the predetermined property of a line-like part (figure 9(A,B,C) of Kanno) of the halftone image (column 4, lines 15-22 of Kanno); and a processing part (figure 1(10) of Kanno) which processes the line-like part of the halftone image by the technique selected by the selection means (column 5, lines 17-19 of Kanno).

Kanno does not disclose expressly that said halftone image is a halftone color image; that said first dithering technique

is a clustered dot dithering technique; and that said second dithering technique is a dispersed dot dithering technique.

Ostrómoukhov discloses, as part of the discussion of the prior art, a halftone color image (column 1, lines 16-23 of Ostromoukhov); a clustered dot dither technique (figure 3 and column 1, line 63 to column 2, line 4 of Ostromoukhov); and a dispersed dot dithering technique (figure 4 and column 1, lines 40-47 of Ostromoukhov). Clustered dot dithering does not render the smaller image details very well (figure 1 and column 2, lines 4-7 of Ostromoukhov) and dispersed dot dithering is better for rendering the smaller image details (column 1, lines 45-47 of Ostromoukhov), but can have certain banding artifacts (figure 2 and column 1, lines 50-54 of Ostromoukhov).

Kanno and Ostromoukhov are combinable because they are from the same field of endeavor, namely digital image data dithering and processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to be able to select between at least two dithering techniques, as taught by Kanno, wherein said first dithering technique taught by Kanno is the clustered dot dithering technique taught by Ostromoukhov, and wherein said second dithering technique taught by Kanno is the dispersed dot dithering technique taught by Ostromoukhov. The clustered dot dithering technique has advantages for a particular type of image data, specifically image data that only requires a restricted number of grayscale levels (column 1, line 63 to column 2, line 4 of Ostromoukhov), such as text, line data, and the like. While the clustered dot dithering technique does not render small image details well (column 2, lines 4-7 of Ostromoukhov), the dispersed dot dithering technique does render small image details well (column 1, lines 45-47 of

Ostromoukhov). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the system taught by Kanno to switch between the clustered dot and dispersed dot dithering techniques taught by Ostromoukhov, depending upon the type of image data encountered. The motivation for doing so would have been that the different dithering techniques provide good results, along with some associated artifacts, for different types of image data (column 1, lines 45-47 and lines 50-54; and column 2, lines 4-7 of Ostromoukhov). Further, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to perform the image processing method on a color image, as taught by Ostromoukhov. The suggestion for doing so would have been that each color plane can be processed as an individual halftone image (column 1, lines 16-23 of Ostromoukhov). Therefore, it would have been obvious to combine Ostromoukhov with Kanno to obtain the invention as specified in claim 8.

Regarding claims 12, 13 and 14: Kanno discloses that said predetermined property includes both the thickness and the density of the line-like parts (figure 9(A-C) and column 6, lines 41-51 of Kanno) and detection of the line-like part of the image is carried out using attribute data received from software (column 5, lines 7-14 of Kanno). The specific image type is determined (column 6, lines 41-51 of Kanno), which includes character (figure 9(A) of Kanno), low-contrast character (figure 9(B) of Kanno), and bold character (figure 9(C) of Kanno). The difference between a bold character and a character is a difference between the thickness, since both a character and a bold character are completely black. The difference between a character and a low-contrast character is one of density since,

in order to be low-contrast, a character must be of a grayscale value that is not completely black, and thus of a lower contrast with the background than either the character or bold character.

8. Claims 2-3, 5, 7, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno (US Patent 4,998,122) in view of Ostromoukhov (US Patent 5,438,431) and Harrington (US Patent 5,153,576).

Regarding claims 2, 9 and 11: Kanno does not disclose expressly that the halftone color image is printed in monochrome by a printer which is not higher than 600 dpi in resolution.

Ostromoukhov discloses printing on a printer (column 1, lines 8-12 of Ostromoukhov) which is not higher than 600 dpi in resolution (column 2, lines 1-4 of Ostromoukhov).

Kanno and Ostromoukhov are combinable because they are from the same field of endeavor, namely digital image data dithering and processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to print on a medium resolution printer, as taught by Ostromoukhov. The motivation for doing so would have been that clustered dot dithering does not render small details well (column 2, lines 4-7 of Ostromoukhov). Therefore, it would have been obvious to combine Ostromoukhov with Kanno.

Kanno in view of Ostromoukhov does not disclose expressly that the halftone color image is printed in monochrome.

Harrington discloses printing a halftone color image in monochrome (figure 2; column 2, lines 45-48 and column 4, lines 30-34 of Harrington).

Kanno in view of Ostromoukhov is combinable with Harrington because they are from the same field of endeavor, namely digital

image data dithering and processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to print the halftone color image taught by Ostromoukhov in monochrome, as taught by Harrington. The motivation for doing so would have been to be able to print on black-and-white printers, which are cheaper to print with (column 1, lines 16-20 of Harrington). Therefore, it would have been obvious to combine Harrington with Kanno in view of Ostromoukhov to obtain the invention as specified in claims 2, 9 and 11.

Regarding claim 3: Kanno discloses that the predetermined property is thickness of the line-like part (column 5, lines 25-27 of Kanno) so that when the line-like part is of a thickness larger than a threshold value, the part is processed by the first dithering technique (column 5, lines 21-27 of Kanno) and when the part is of a thickness not larger than the threshold value, the part is processed by the second dithering technique (column 9, lines 36-43 of Kanno). If the line-like part is bold (column 5, lines 25-27 of Kanno), then said line-like part clearly has greater thickness than if said line-like part is not bold. The point at which the method taught by Kanno considers the line-like part to be bold is the thickness threshold. Further, as discussed above in the arguments regarding claims 1 and 10, the first dithering technique is the clustered dot dithering technique and the second dithering technique is the dispersed dot dithering technique.

Regarding claim 5: Kanno discloses that the predetermined property includes both the thickness and the density of the line-like parts (column 5, lines 25-27 of Kanno) so that when the line-like part is of a thickness smaller than a first

threshold value (column 9, lines 39-43 of Kanno) and at the same time of a density higher than a second threshold value (column 4, lines 3-7 and lines 15-22 of Kanno), the part is processed by the second dithering technique (column 9, lines 36-43 of Kanno) and otherwise the part is processed by the first dithering technique (column 5, lines 21-27 of Kanno). If the line-like part is bold (column 5, lines 25-27 of Kanno), then said line-like part clearly has greater thickness than if said line-like part is not bold. If the line-like part is a character, then the line-like part is thicker than a photograph region and a low-contrast region (column 4, lines 3-7 and lines 15-22 of Kanno). The point at which the method taught by Kanno considers the line-like part to be bold is the first thickness threshold and the point at which the method taught by Kanno considers the line-like part to be a character (and not a bold character or low-contrast character) is the second thickness threshold. Further, as discussed above in the arguments regarding claims 1 and 10, the first dithering technique is the clustered dot dithering technique and the second dithering technique is the dispersed dot dithering technique.

Regarding claim 7: Kanno discloses that two series of brush patterns are respectively prepared in advance for the first dithering technique and the second dithering technique (figure 3; column 4, line 66 to column 5, line 5; and column 9, lines 65-68 of Kanno), each series of brush patterns being prepared according to the density of the line-like part (column 4, lines 58-64 of Kanno), and the first dithering technique and the second dithering technique are carried out by the use of the brush patterns selected (column 4, lines 15-21 of Kanno) according to the density of the line-like part (column 4, lines

42-47 of Kanno). Dithering matrices (figure 3 of Kanno) are stored in memory for use (column 4, line 66 to column 5, line 5 of Kanno) depending upon the selection results (column 9, lines 65-68 of Kanno). Further, as discussed above in the arguments regarding claims 1 and 10, the first dithering technique is the clustered dot dithering technique and the second dithering technique is the dispersed dot dithering technique.

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno (US Patent 4,998,122) in view of Ostromoukhov (US Patent 5,438,431), Harrington (US Patent 5,153,576), and obvious engineering design choice.

Regarding claim 4: Kanno in view of Ostromoukhov and Harrington does not disclose expressly that the threshold value is a value corresponding to 4 dots. However, 4 dots would clearly be one value which the line-like part could be considered bold. Some particular value must be selected as a threshold in order to operate the system taught by Kanno in view of Ostromoukhov and Harrington. Therefore, a threshold value of 4 dots is a mere engineering design choice.

10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno (US Patent 4,998,122) in view of Ostromoukhov (US Patent 5,438,431), Harrington (US Patent 5,153,576), and Hines (US Patent 6,034,782).

Regarding claim 6: Kanno in view of Ostromoukhov and Harrington does not disclose expressly that the method is carried out by a printer driver.

Hines discloses carrying out digital image data dithering using a printer driver (column 3, lines 23-27 of Hines).

Kanno in view of Ostromoukhov and Harrington is combinable with Hines because they are from the same field of endeavor, namely digital image data dithering and processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a printer driver to perform image data dithering, as taught by Hines, wherein the image data dithering method used is the method taught by Kanno in view of Ostromoukhov and Harrington. The motivation for doing so would have been that a printer driver is a typical piece of printing software that is used in dithering and halftoning images in a printing system. Therefore, it would have been obvious to combine Hines with Kanno in view of Ostromoukhov and Harrington to obtain the invention as specified in claim 6.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James A. Thompson
Examiner
Art Unit 2624

27 October 2005

THOMAS D. LEE
PRIMARY EXAMINER